Challenges in Sustaining and Increasing Fish Production to Combat Hunger and Poverty in Asia

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Abstract

Fish and fisheries make a major contribution to nutritional security and the fight against hunger and poverty in Asia. An additional 37 million t of food fish will be needed by 2020 to meet the needs of the growing population, changing dietary habits and increasing income levels. Production from capture fisheries has reached a plateau, with most fisheries having reached their maximum sustainable yields or being overexploited. A number of challenges need to be addressed if the present production from capture fisheries is to be sustained and aquaculture production increased to bridge the gap between the supply and the growing demand for fish. This needs the commitment of governments to implement policies that foster growth of fisheries and aquaculture and to allocate adequate human and financial resources to the development of the sector.

Introduction

Today we live in a world where poverty, hunger and malnutrition are prevalent. It has been estimated that 14 per cent of the global population or 852 million people are going hungry and of these 690 million are in the Asia-Pacific region. Micronutrient deficiencies or hidden hunger in one form or the other are affecting more than 2 billion people worldwide. Each year, 5.5 million children are dying of causes related to hunger and malnutrition. Over 1.1 billion people live on less than US$1 a day, of which 700 million are in Asia. Fifty per cent of the hungry are in small-holder farming households and 20 per cent among the landless poor. These statistics reveal the unpalatable truth that in a world that has both resources and knowledge, the situation remains a continuing travesty of the recognized fundamental human right to adequate food and freedom from hunger and malnutrition.

The Millennium Development Goals adopted by the world's governments in 2000 set a target of halving the hungry and malnourished population by 2015. However, hunger and malnutrition still remain the most devastating problems facing the poor in developing countries and we have a long way to go towards eliminating hunger.

Fish and fisheries can play an important role in addressing hunger and poverty in Asia. Fish are a rich source of protein, essential fatty acids, vitamins and minerals. The fats and fatty acids in fish, particularly the long chain n-3 fatty acids (n-3 PUFA), are highly beneficial and difficult to obtain from other food sources.

Fish contributes over 20 per cent of the animal protein intake for more than 2.6 billion people around the world. For example, the contribution of fish to animal protein intake is estimated at 34.5 per cent in Malaysia, over 53 per cent in Indonesia and Sri Lanka, and 84.4 per cent in the Maldives. However, these national averages hide the importance of fish to the rural poor and coastal communities. In many countries of the Asia-Pacific region, rural poor household depend on fish for as much as 60-80 per cent of their animal protein intake.

In addition to contributing to nutritional security, the sector has been providing employment to over 35 million people in Asia directly and many more when the support sector is included.

Today fish is the most internationally traded commodity. It is estimated that in 2003 global trade in fish was to the tune of US$63 billion (FAO 2006). The exports of fish and fisheries products from developing countries exceed those of meat, dairy, cereals, sugar, coffee, tobacco and oilseeds. About 40 per cent of global fish production was traded across countries in 1998 as compared to 10 per cent of meat production. This is astonishing for a perishable commodity like fish and highlights the increasing demand for fish with changing dietary preferences.

The Aquaculture in the Third Millennium conference (Subasinghe et al. 2000) and the World Food Summit five years later recognized the role that aquaculture can play in national economic development, global food supply, achievement of food and nutritional security and the livelihood of very many poor people.

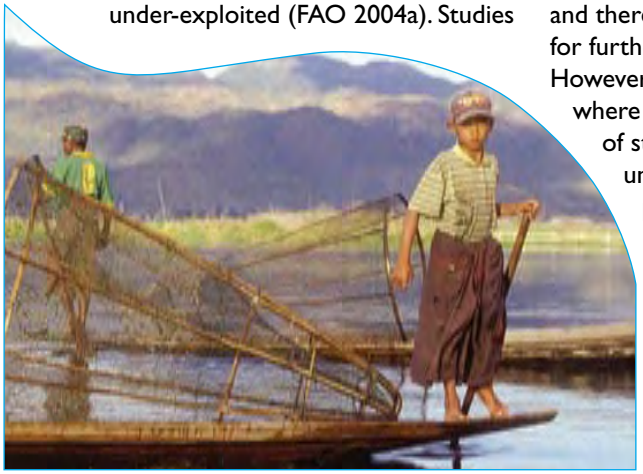
Status of Fisheries

Fisheries in Asia have shown a robust performance compared to the rest of the world. Asia contributes over 50 per cent of the global production of capture fisheries and 91 per cent of global aquaculture production (FAO 2006). Between 1980 and 2001, the production of fisheries in Asia grew at an annual average of 5.8 per cent as against the global average of 2.8 per cent. It has been estimated by the WorldFish Center and the International Food Policy Research Institute (IFPRI) that by the year 2020, the annual production of food fish must increase by 37 million t over the present food fish production of about 101 million t to meet the demand of the growing population, changing dietary habits and rising incomes (Delgado et al. 2003). Much of the increased demand for fish will be in the developing countries. For example, China will need 53 million t compared to 33 million t in 1997; Southeast Asia will require 17 million t as against 11 million t in 1997 (Delgado et al. 2003).

Increased production does not necessarily lead to food or livelihood security. What is needed is for the poor to have access to food. Hence, if fish and fisheries are to contribute to eradicating hunger and poverty and improving the lives of the poor who depend on fish, a number of challenges need to be addressed.

Capture Fisheries

Available information indicates that out of 600 major marine fisheries studied, 50 per cent are fully exploited. This indicates that they have reached their maximum sustainable yields and there is no room for further increase in production. Twenty four percent of the stocks are over exploited, depleted or recovering from depletion and only 3 per cent are under-exploited (FAO 2004a). Studies undertaken by the The WorldFsh Center and its partners in 9 countries of Asia indicate an alarming decline in coastal fisheries, with biomasses down to 5-30 per cent of levels prior to the expansion of fishing. This has resulted in a decline in the relative abundance of larger and high value species and an increase in the abundance of smaller, low value fish. For example, trash fish landings in the South China Sea and the Gulf of Thailand have exceeded 60 per cent of the catch and are 30-80 per cent in Viet Nam (Silvestre et al. 2003; FAO 2004b). This is leading to declining employment, incomes, food security and rural social stability, resulting in increased poverty among coastal fishers. Some areas in the western and eastern Indian Ocean, the western central Pacific Ocean and the northwest Pacific Ocean are showing an increase in catches and there is still some potential for further increasing production. However, these are the areas where the state of exploitation of stocks is unknown or uncertain and, therefore, production estimates and stock assessments are less reliable (FAO 1999). The World Summit on Sustainable Development recommended restoring the stocks to their original status by the year 2015. The major challenge is to rebuild the depleted stocks and exploit them at sustainable levels, and ensure that small-scale fishers have access to fisheries resources in the face of competition from large-scale operators.



Inland fisheries in most countries have been exploited to their maximum levels or have been over exploited, with no indications of a potential for increased production. In addition to over fishing, inland fisheries have been adversely affected by alteration or destruction of aquatic habitats, soil erosion and changes in the hydrological characteristics of rivers, lakes and

floodplains. Annual catches from inland fisheries were around 8.7 million t during 2000-2002. This might be an underestimate, as most official national statistics do not include fish caught by the rural population. Six Asian countries are among the top ten in terms of production from inland fisheries and they contribute nearly 65 per cent of the global production from inland fisheries (FAO 2004a). China alone produces as much as a quarter of the global production from inland fisheries and nearly three times as much as the second largest producer, India.

The major challenges to be addressed for increasing fish production from marine capture fisheries on a sustainable basis and maximizing its contribution to nutritional and livelihood security are:

- Control of over exploitation through regulated fishing. The last tsunami destroyed fishing craft and gear in many countries. This created an opportunity to rehabilitate the affected fishermen in other livelihood activities that would have resulted in reducing fishing pressure on affected stocks. However, in some countries, the generous development assistance resulted in more boats than before the tsunami, implying increased pressure on already over exploited stocks.

- Enforcement of closed fishing seasons where necessary. In India, the government is enforcing closure of fisheries for two to three months during the breeding season of fish and this appears to have had positive results. However, for this management measure to succeed, it is necessary to provide alternative employment opportunities for the fishing community affected.

- Reduction of destructive fishing practices by promoting responsible fishing practices.

- Establishment of an ecosystem approach to fisheries management as opposed to a piecemeal approach.

- Reduction of post-harvest losses and use of by-catch.

As noted earlier, most inshore waters have been heavily fished and fishing in distant waters should be encouraged. All these measures involve putting restrictions on the livelihoods of fishing communities that depend solely on fishing and will lead to unrest among them. Enforcement

of closed seasons along a 150 km stretch of the coast of Orissa state in India led to severe hardship among fishers and a number of suicides have been reported. Therefore, the implementation of controls on fishing should be accompanied by greater transparency in decision making through stakeholder participation and their involvement in the management of fisheries, i.e., community based fisheries management or co-management. In many countries, this would necessitate changes in existing policies.

Inland fisheries resources have been generally under-valued and under threat from habitat alteration and degradation, changes in river flows, pollution and over exploitation. Over 50 per cent of inland fish species occur in rivers, and rivers contain a higher proportion of organisms classified as threatened or endangered than do most other ecosystems (LARS 2003). The major challenges that need to be addressed for sustaining and increasing production from inland fisheries are:

- Restoration of habitat and control of pollution.

- Reduction of effects of water abstraction on fisheries through inclusion of fisheries in all water development projects at the planning stage.

- Incorporation of ecological flow requirements of river-floodplain systems into development plans taking into account the cues needed by the fish for migration and reproduction.

- Regulation of fishing pressure through enforcement of closed seasons.

- Development of a reliable catch data collection system as, unlike marine fisheries, no reliable data are available on the catch, effort and the status of stocks.

- Establishment of sanctuaries for restoration of stocks.

- Stock enhancement through stocking of seed of commercially important species, especially in small water bodies such as reservoirs, lakes and rivers.

- Inclusion of inland fisheries in the valuation and management of multiple uses of water resources.

- Conservation of genetic resources.

Aquaculture

Global aquaculture production grew at an annual average rate of 8.9 per cent since 1970, as compared to 1.2 per cent for production from capture fisheries and 2.8 per cent for terrestrial farmed animal meat production. While the sector represented only 6 per cent of food fish production in 1970, its share increased to 12 per cent in 1985 and to 32 per cent in 2003. Asia accounts for over 91 per cent of global aquaculture production by weight and 82 per cent by value. Production increased from 14.3 million t in 1989 to over 42 million t in 2003, an annual growth rate of 11 per cent. Thus, it is the fastest growing food production sector in agriculture. Much of this growth has been in China, where the annual growth rate was 15 per cent. In the rest of Asia, the growth rate was only 3 per cent. Of the total aquaculture production of 42 million t in 2003, 60 per cent was from freshwater aquaculture and the rest from mariculture, indicating the importance of freshwater aquaculture to increased nutritional security. Further, most of the species cultured in brackish and marine waters are carnivores and require fishmeal in their feed, which puts more pressure on already depleted marine stocks.

Nearly 80 per cent of aquaculture production comes from small-holder operated farms. Thus, small-holder farmers are not only consumers of fish but also the producers. To eliminate hunger and poverty in this segment of the population, the issue of their access to resources, lack of skills, vulnerability and aversion to risks have to be addressed. In the context of growing global demand for fish, the stringent requirements for environment and product quality, and the hope that aquaculture will bridge the gap between demand and supply, the following challenges need to be addressed:

Making science relevant to the needs of the farming community. This would mean understanding contextual circumstances, operating environments and the conditions that enable the poor to take advantage of opportunities. While great strides have been made in developing freshwater aquaculture technologies that suit different categories of farms and farmers, mariculture and brackishwater aquaculture have not had the same support. Thailand has progressed in this respect by developing breeding and culture technologies for some of the species. Mariculture is in its infancy in the rest of Asia.

Placing aquaculture in the context of rural development. The Millenium Project Task Force on Hunger (2004) indicates that 50 per cent of the hungry are in farm households and 22 per cent among the rural landless. Therefore, aquaculture development must be placed in the context of rural development and incorporated into other farming activities rather than developed as a stand alone activity. Systems for integrating aquaculture with crop farming, livestock raising and watershed management that were developed in Asia are now being tried in Africa. These systems have resulted in increased household incomes, diversification of crops and reduction of risk, and are environmentally friendly. For example, integration of aquaculture with rice farming in Bangladesh resulted in increasing net benefits from integration by as much as 64-98 per cent, lowered cost of production, increased rice yields, reduced use of pesticides, herbicides and fertilizers, as compared to only monoculture of rice (Gupta et al. 1998).

Enabling access to resources. According to FAO and the International Labour Organisation (ILO), out of 1.1 billion people involved in agriculture globally, 450 million work as wage labor earning less than US$1 a day. As was demonstrated in Bangladesh by The WorldFish Center in collaboration with concerned government agencies and NGOs, the landless labor can be involved in aquaculture in unutilized and/or derelict public and privately owned ponds as well as in capture based culture fisheries in flooded lands. The landless were formed into groups and the NGOs helped these groups to lease the waters and made micro-credit available to them, while the scientists provided the technical inputs. This collaboration between the NGOs and the public sector helped the landless by creating livelihoods and at the same time increasing fish production

from derelict waters. This has completely changed the rural landscape in Bangladesh.

Empowering women through aquaculture.

In many countries of Asia, poor rural women, especially from depressed agriculture households, have hardly any means of earning an income, which results in a low social status for them. The 1992 report of the government of Bangladesh to the Fourth World Conference on Women held in Beijing says "the majority of women in Bangladesh are underprivileged, under nourished, illiterate and poor. The life patterns of most women are conditioned by age old traditions and male dominated institutions governing the family, society and the economy……females eat last and least" (CGIAR 1998). In this scenario, aquaculture of food and ornamental fishes has provided opportunities for improving household incomes and nutrition. Studies undertaken in Bangladesh have indicated that women are as good if not better at aquaculture than men farmers and their involvement in aquaculture has not only contributed to household incomes and better nutrition but has raised their status in the household and society (CGIAR 1998).

Improving fish breeds.

Better farm management can increase production from aquaculture operations to some extent. However, use of improved breeds of fish can make further significant improvements in production. Great strides have been made in improving the productivity of crops and livestock through genetic enhancement and modification. In the case of fish, though aquaculture has thousands of years of history, most of the cultured species have not been domesticated and most of the cultured tropical fish are worse than their wild cousins due to years of inbreeding. While some progress has been made in improving the breeds of temperate fishes such as salmon and trout, tropical fishes have not been improved until quite recently. Research undertaken by The WorldFish Center has resulted in developing methods for the genetic improvement of tropical finfish, with Nile tilapia as a test species.

The Nile tilapia has shown 80 per cent faster growth after five generations of improvement (Gupta and Acosta 2004). A large number of freshwater and marine species are being cultured in Asia and these need to be improved genetically to enhance aquaculture productivity. Unlike crops and livestock, the life cycles of some of these cultured species are long and they take 2-3 years to mature. Since aquaculture genetics research is new in many of the developing countries, there is need for networking among countries as has been demonstrated by International Network on Genetics in Aquaculture (INGA) (Gupta and Acosta 2001).

Certification of seed.

While the quantity of fish seed produced in most countries is adequate, especially in the case of freshwater aquaculture species, there is no standardization of seed quality and certification as in the case of many agricultural commodities. This is often detrimental to production. It is essential that protocols for certification of seed be developed and implemented.

Regulating use of chemicals and antibiotics.

Improper use of antibiotics and chemicals and other pharmacologically active compounds can have adverse effects on the health of consumers. With sanitary and phytosanitary measures coming into force and the importing

countries becoming strict with regard to residues of harmful chemicals and antibiotics in aquatic products, it is essential that the use of harmful chemicals and antibiotics be controlled.

Managing fish health. Transmission of fish diseases is a major challenge in increasing fish production from aquaculture. The collapse of shrimp aquaculture in 1990s and the collapse of carp aquaculture in late 1980s are examples of what can happen if care is not taken. Increasing demand for fish will result in further intensification and expansion of aquaculture and care has to be taken at the planning stage for the health management of cultured organisms, especially in the case of shrimp culture.

Making credit available. A major constraint faced by small scale farm households is lack of access to credit from public sector banks/institutions because of various administrative hurdles and the need for collateral. As has been successfully demonstrated in Bangladesh and elsewhere, easy availability of credit motivates small farmers to take up new technology and increase production. NGOs have an important role in making credit accessible to the rural population.

Ensuring safety of the environment. Aquaculture, if not properly planned and managed, can affect the environment through pollution from effluents and chemicals, Coastal aquaculture in some countries has resulted in the destruction of thousands of hectares of mangroves, and salination of soils. With intensification of aquaculture both horizontally and vertically, it is necessary to ensure that the environment is not affected due to lack of safeguards and proper planning.

Establishing public and private partnerhips. The excellent partnership between public and private sector institutions has been very fruitful in the crop sector as evidenced by the green revolution. Such collaboration needs to be established in aquaculture also.

Providing policy support. Aquaculture has made great strides and the contribution of aquaculture to total fish production increased from 6 per cent in the 1960s to 32 per cent in 2003. Delgado et al. (2003) estimate that it will have to increase to 45 per cent if the gap between the supply and demand for fish is to be narrowed. This increase is dependent on the policy atmosphere in developing countries.

Most countries have policies for the development of aquaculture but lack the strategies, development plans and allocation of adequate resources (human and financial) to ensure that these policies actually benefit the poor. It is important that these policies be properly implemented. These governments should increase investment in research to at least 2 per cent of GDP from agriculture. The remarkable progress made in China is attributable to government policies that encouraged and supported small-holder farms.

In addition to the commitment of national governments, increased financial assistance is needed from the development assistance community. Development assistance in 2002 was estimated at 0.23 per cent of their GDP as against the promised 0.7 per cent. External assistance to agriculture and rural development in developing countries decreased from US$3.7 billion to US$2.4 billion between 1990 and 2000. In

recent years the agriculture sector has represented about 7.9 per cent of World Bank lending as against 30 per cent in the early 1980s. In Kofi Annan's words, a "quantum leap" is needed in development assistance if we are to achieve the Millenium Development Goal of reducing hunger and poverty by half by 2015.

Conclusion

The Millennium Task Force on Hunger (2004) has recommended that to relieve hunger and poverty, national policies should restore budgetary priorities for agriculture (as the engine of economic growth), empowerment of women and building of human capacity in all sectors involved in reducing hunger. While there are ample opportunities for fish and fisheries to make a major contribution to food and nutritional security and to contribute to the eradication of poverty, there are a number of challenges that need to be addressed. What is needed is political will, policy change and effective and efficient implementation. Our fight against hunger is a long process and we need patience, endurance and great commitment.

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